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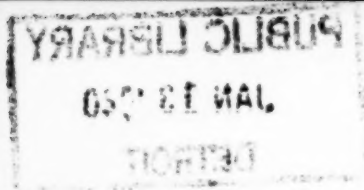
Summary of the Current Prevalence of Communicable Diseases

Spirocheticidal Activity of Some Brands of Neoarsphenamine

Hemorrhagic Necrosis of Adrenals in Rats on Deficient Diets

Histological Study of Hemorrhagic Adrenal Necrosis in Rats





FEDERAL SECURITY AGENCY  
UNITED STATES PUBLIC HEALTH SERVICE

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It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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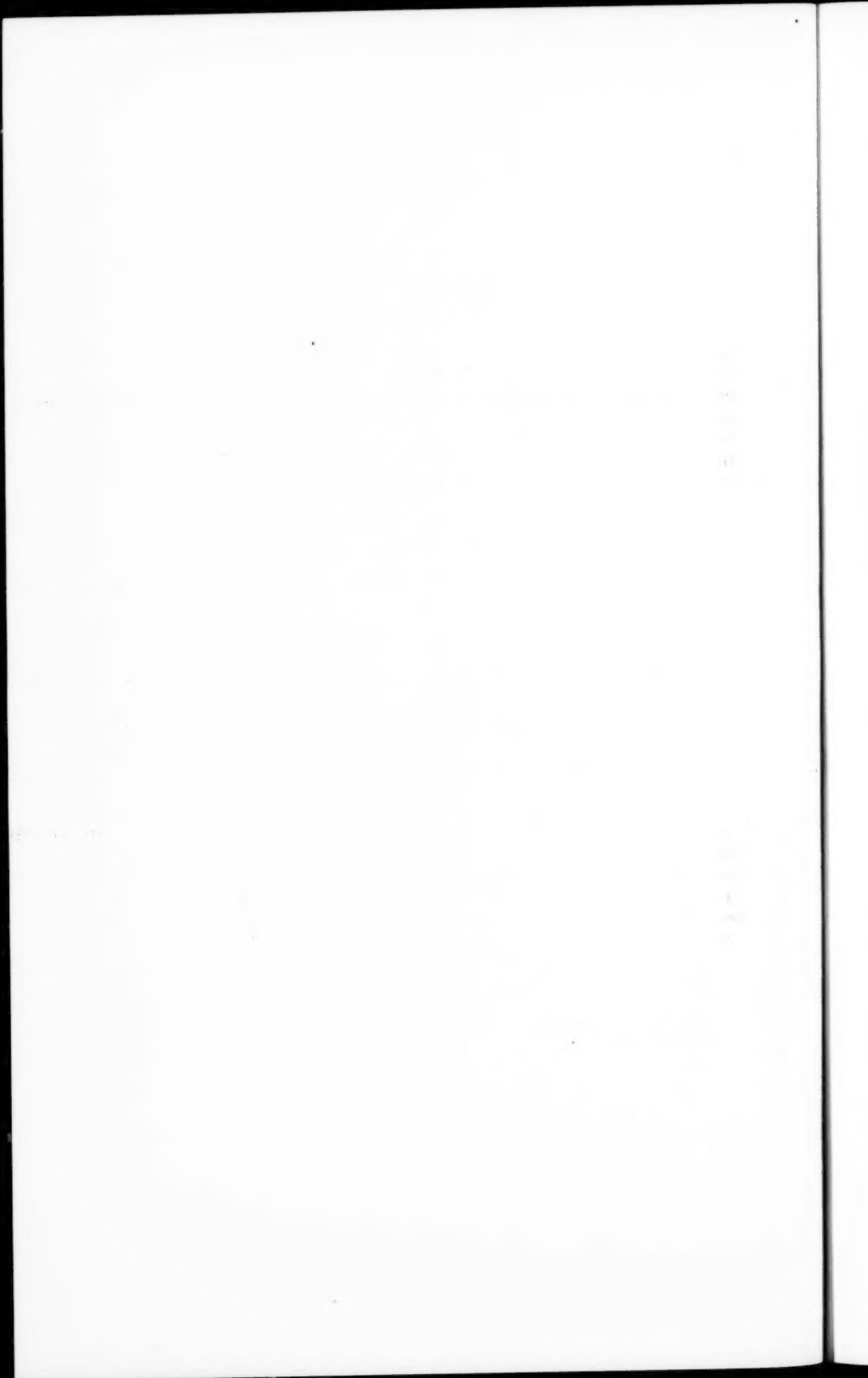
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# Public Health Reports

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## PREVALENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES

November 5–December 2, 1939

The accompanying table summarizes the prevalence of eight important communicable diseases, based on weekly telegraphic reports from State health departments. The reports from each State are published in the Public Health Reports under the section "Prevalence of disease." The table gives the number of cases of these diseases for the 4-week period ended December 2, 1939, the number reported for the corresponding period in 1938, and the median number for the years 1934–38.

### DISEASES ABOVE MEDIAN PREVALENCE

*Poliomyelitis.*—As might normally be expected, the cases of poliomyelitis dropped about 50 percent during the 4 weeks ended December 2; there were 576 cases reported during the current period, as compared with 1,163 during the preceding 4-week period. All sections of the country contributed to the rise of the incidence, and all sections also participated in the decline.

Since there was no epidemic of poliomyelitis in 1938 the comparison with that year is most unfavorable, and the current incidence (576 cases) represents an increase of approximately 75 percent over the 1934–38 median incidence for this period. The current incidence is the highest since 1931, when the cases for this period numbered 625. While the recent rise will be classed among the minor epidemics of this disease, it has extended over an unusually long period of time, beginning about the first of May (in South Carolina) and maintaining a relatively high level up to and including the current period.

*Influenza.*—The number of reported cases of influenza rose from approximately 3,400 for the preceding 4 weeks to 7,581 for the 4 weeks ended December 2. The incidence was more than 1.5 times that for the corresponding period in 1938, and more than twice the 1934–38 average incidence for this period. An increase of cases of this disease is normally expected at this season of the year, but in the South Atlantic, South Central, and Mountain regions the current incidence

appeared to be considerably above the average incidence for recent years. In the North Atlantic, North Central, and Pacific regions the incidence was relatively low.

*Number of reported cases of 8 communicable diseases in the United States during the 4-week period Nov. 5-Dec. 2, 1939, the number for the corresponding period in 1938, and the median number of cases reported for the corresponding period 1934-38*<sup>1</sup>

Division	Current pe- riod	1938	5- year me- dian	Current pe- riod	1938	5- year me- dian	Current pe- riod	1938	5- year me- dian	Current pe- riod	1938	5- year me- dian
	Diphtheria			Influenza <sup>2</sup>			Measles <sup>3</sup>			Meningococcus meningitis		
United States <sup>1</sup> .....	3,074	3,570	3,804	7,581	4,905	3,721	7,479	10,095	10,095	132	135	279
New England.....	48	104	59	11	36	24	1,481	924	1,016	3	4	9
Middle Atlantic.....	333	323	352	74	79	94	1,024	1,710	2,023	29	26	39
East North Central.....	450	631	636	285	261	384	972	1,835	835	11	14	35
West North Central.....	152	313	349	71	146	192	648	2,290	1,901	8	7	21
South Atlantic.....	1,036	946	1,162	3,838	1,774	1,233	641	1,132	1,132	26	31	49
East South Central.....	398	435	553	857	468	468	96	198	198	19	31	31
West South Central.....	447	532	532	1,535	1,400	953	173	347	110	17	8	16
Mountain.....	67	123	108	766	543	219	552	930	637	9	8	8
Pacific.....	143	163	214	144	198	224	1,892	1,729	881	10	6	20
	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and para- typhoid fever		
United States <sup>1</sup> .....	576	90	332	13,626	14,007	17,052	198	494	494	735	775	1,061
New England.....	10	4	7	475	632	944	0	0	0	14	24	24
Middle Atlantic.....	132	25	35	2,644	2,247	2,837	0	0	0	103	93	136
East North Central.....	72	9	54	4,428	4,919	5,666	59	156	103	77	96	116
West North Central.....	98	8	40	1,746	1,807	2,246	95	176	176	48	78	94
South Atlantic.....	43	17	18	1,593	1,227	1,413	3	1	1	151	113	194
East South Central.....	42	11	31	902	849	758	1	15	9	50	76	123
West South Central.....	27	9	18	458	681	476	23	57	21	159	168	215
Mountain.....	55	2	15	485	471	815	9	55	84	32	78	77
Pacific.....	97	5	63	895	1,174	1,174	8	34	109	101	49	50

<sup>1</sup> 48 States. Nevada is excluded and the District of Columbia is counted as a State in these reports.

<sup>2</sup> 44 States and New York City.

<sup>3</sup> 47 States. Mississippi is not included.

#### DISEASES BELOW MEDIAN PREVALENCE

*Diphtheria.*—The number of reported cases of diphtheria, 3,074, was at the lowest level for this period in 11 years. Last year 3,250 cases were reported for the corresponding period and the average number of cases for the preceding 5 years was approximately 3,800 cases. In the South Atlantic region the number of cases, 1,036, was about 10 percent above the number reported in 1938, and the Middle Atlantic region reported a slight excess over last year's incidence, but in all regions the incidence was lower than the 1934-38 average for this period.

*Measles.*—For the country as a whole the number of cases of measles (7,479) was only about 75 percent of the number reported for the corresponding period in 1938, which figure (10,095) also represents the 1934-38 average incidence for this period. In the New England and

Pacific regions the incidence was the highest in recent years, while the East North Central and West South Central reported minor increases over the normal seasonal incidence; in other regions the numbers of cases were comparatively low.

*Meningococcus meningitis.*—During the current period, 132 cases of meningococcus meningitis were reported, approximately the same incidence as was recorded for the corresponding period in 1938. The average number of cases reported for this period in the years 1934–38 was 279, more than twice the number reported for the current period. With the exception of the year 1934, when 129 cases were reported for this period, the current incidence is the lowest in the 11 years for which these data are available.

*Scarlet fever.*—The scarlet fever situation was more favorable than it was in 1938 in all sections of the country except the South Atlantic and East South Central regions, where the numbers of cases were approximately 25 percent and 10 percent above last year's figures for this period. In those regions the incidence was also slightly above the 1934–38 median figures for this period, but in all other regions the incidence was low in relation to the experience of recent years. The total number of reported cases (13,626) represents a decline of approximately 25 percent from the preceding 5-year average incidence.

*Smallpox.*—The smallpox incidence was highly favorable in comparison with recent years. During the current period, 198 cases were reported, compared with 494, 910, and 333 for the corresponding period in 1938, 1937, and 1936, respectively. All sections except the South Atlantic and West South Central participated in the decline.

*Typhoid fever.*—The incidence of typhoid fever remained relatively low. While the number of cases (735) was only slightly below the number reported for this period in 1938, it was only about 70 percent of the preceding 5-year average figure (1,061) for the corresponding period. In the Middle Atlantic, South Atlantic, and Pacific regions the figures were higher than those for last year, but only one region, the Pacific, reported an excess over the 1934–38 median figure. The excess in the Pacific region seemed to be largely due to a comparatively large number of cases in California, where there were 74 cases reported for the current period as compared with 22, 38, and 33 for the corresponding period in 1938, 1937, and 1936, respectively.

#### MORTALITY, ALL CAUSES

The average mortality rate from all causes in large cities for the 4 weeks ended December 2, based on data received from the Bureau of the Census, was 10.9 per 1,000 inhabitants (annual basis). The current rate is the lowest recorded for this period in 8 years; the average rate for the years 1932–38 was 11.2.

## THE RELATION BETWEEN THE TRYPANOCIDAL AND SPIROCHETICIDAL ACTIVITIES OF NEOARSPHENAMINE

### V. THE SPIROCHETICIDAL ACTIVITY OF THE SEVERAL AMERICAN BRANDS OF NEOARSPHENAMINE<sup>1</sup>

By T. F. PROBEY, *Associate Pharmacologist, National Institute of Health, United States Public Health Service*

In previous reports (1, 2, 3, 4) on the relation between the trypanocidal and spirocheticidal activities of neoarsphenamine, evidence was presented which indicated that the former test should not be accepted as a reliable index of the therapeutic efficiency in experimental syphilis in rabbits. In these studies it was shown that two brands of neoarsphenamine, representing two types (5) of this drug, varying in trypanocidal activity, were remarkably uniform in spirocheticidal activity as determined by the therapeutic dose (1), prophylactic dose (2), and sterilizing dose (4), and showed no significant difference in their ability to influence the reacting substances in sera from cases of syphilis in man (3).

The spirocheticidal activity having been determined on only two brands of neoarsphenamine, it was deemed advisable to continue the study to include all American products in order to check their activity in sterilizing or curing rabbits infected with experimental syphilis.

Schamberg and Kolmer, with Madden (6), reported the spirocheticidal activity of 18 lots representing 7 brands of neoarsphenamine. In their report each preparation was tested at 10 to 20 mg. per kilogram (2 rabbits at each dose). The report shows that none of the 18 lots was completely spirocheticidal in doses of 15 mg. per kilogram or less; at 20 mg. per kilogram 14 lots were effective.

Voegtlin and Dyer (7) reported that the sterilizing efficiency of the arsphenamines was identical in terms of absolute amount of arsenic used, or, in other words, "the sterilizing action of these drugs depends entirely on the amount of arsenic injected, irrespective of whether this arsenic is in the form of arsphenamine, neoarsphenamine, or sulfarsphenamine." They also observed that an essential relationship of the size of the dose to its sterilizing effect is apparent in experimental rabbit syphilis, as indicated by the definite minimum concentration of the arsenical needed to kill all of the parasites in the infected host. The minimal sterilizing dose for neoarsphenamine was recorded as 40 mg. per kilogram, which cured all of 6 animals. The subcurative doses reported are as follows: 24 mg. cured 40 percent of 5 rabbits; 16 mg. cured 50 percent of 6 animals; 2 rabbits given 12 mg. and 1 given 8 mg. were not cured.

Raiziss and Severac (8), reporting experiments extending over several years, established the minimal curative dose for neoarsphenamine

<sup>1</sup> Previous papers in this series are listed in references 1, 2, 3, and 4.

at 40 mg. per kilogram. In one series of 27 lots this dose was effective in 25 lots. These authors recorded agreement with other investigators, noting an exception to the report of Tatum and Cooper (9) of 180 mg. per kilogram as the effective dose for neoarsphenamine.

The differences recorded in chemotherapeutic studies in experimental syphilis in rabbits may be due, in part, to the great variation in the time the tissue transfer rabbits are observed. In the technique described by Raiziss and Severac (10) the observation time recommended was at least 6 months, whereas Kast, Peterson and Kolmer (11) observed their animals for 8 to 12 weeks, and Eagle (12) reports 6 to 8 weeks with subtransfers. Bessemans et al. (13), in 1935, corroborated the reports of numerous workers that the smaller the graft (number of organisms) the longer the incubation period in experimental syphilis. The longer observation time for the tissue transfer animals appears to be indicated.

#### EXPERIMENTAL

The technique of infecting the rabbits was the same as that described in previous reports (4). Periodic examinations were made to follow the development of the primary lesions before treatment. Only animals which developed a darkfield lesion (positive, typical primary) were used.

Treatment consisted of one intravenous injection of the dose and brand of neoarsphenamine shown in table 1. The control group received no treatment. The progress of the disease and the effect of the treatment are recorded by observation of the evolution of the lesion by darkfield examination and by the tissue-transfer method.

The pretreatment observation period of 2 months allowed the primary lesions to be well developed and the disease to reach definitely the late stage of the active, primary animal infection. The post-treatment observation of approximately 3 months allowed sufficient time for the infection to develop from organisms surviving the treatment. The transfer period observation of 4 months or more permitted the development of the disease even in slow infections following tissue transfers. In addition to the routine examination of the testes, glands, etc., at least 4 darkfield examinations were made on all negative rabbits. Frequently lesions developed in the traumatized area caused by the puncture for darkfield material, and it is believed that had this procedure not been followed the animals in several instances would have been discharged without evidence of the infection.

The evaluation of the sterilizing or curative efficiency of neoarsphenamine was based upon the minimal dose of the drug which cured rabbits with well-developed primary syphilitic lesions. Proof of the cure of the infected rabbits was established by tissue transfers from the popliteal lymph gland and original inoculated testicle.

TABLE 1.—*Spirocheticidal activity of 17 lots of nearsphenamine representing 7 brands*

Series	Product	Results of tissue transfers										Mini- ma- l effec- tive dose (mg.)	Arsenic con- tent (per- cent)	Observation times				
		Dose (mg. per kg.)												Untreated controls		Pre- treat- ment	Post- treat- ment	Trans- fer period
		40 mg.		30 mg.		25 mg.		20 mg.		Neg- ative	Posi- tive							
		Nega- tive	Posi- tive	Nega- tive	Posi- tive	Nega- tive	Posi- tive	Nega- tive	Posi- tive									
1-3.....	E7.....	7	0	13	0							3	30	19.40	69	14	18	
	F6.....	5	0	5	1					5	4	2	30	19.30	61	12	18	
	F7.....	3	0	5	0					7	1	0	30	19.52	62	15	16	
4.....	F8.....	5	0	4	0					4	2		30	19.20				
	F8.....	5	0	4	0					4	4		30	19.11				
	D3.....	5	0	4	0					2	3	0	30	18.93	55	12	24	
5.....	F9.....					3	3	0	3				(?)	19.07				
	D4.....			3	1	4	2	3	2	0	2	30	20.44	76	23	19		
	G4.....			7	0	5	1	2	5				25	20.16				
6.....	A4.....			7	0	5	1			0	4		25	19.07	68	13	18	
	E9.....			6	0								25	19.38				
7.....	E10.....					10	0						25	21.1				
	F9.....					8	1			1	3		25	20.70	65	15	25	
	A5.....					9	1						(?)30	19.38				
8.....	E10.....			6	2					0	5		30	21.1				
	F9.....			7	1	3	5	0	5				(?)	19.60	68	13	25	
	C5.....			2	2	3	5	0	5	0	4		40	19.51				
9.....	E11.....	5	1	3	2					1	3		40	20.14				
	H6.....	6	0	5	2					1	4		40	19.60				
	C5.....	5	1	4	2					1	4		40	19.60				
	C6.....	5	1	1	5					0	4	0	40	19.45	73	11	20	
1-9.....		51	3	84	22	60	22	35	61	1	28							
Percent.....		94.4		79.2		73.2		36.4			96.5							

The spirocheticidal activity of 17 lots of neoarsphenamine, representing the 7 American brands, as determined by the sterilizing or curative efficiency in experimental syphilis in rabbits, is recorded. The report consists of 9 independent tests, each requiring approximately 1 year to complete. In each test brand E was used as the control product (E-7, 8, 9, 10, 11) thereby establishing a basis for comparison for the entire series.

Series 1 to 3, inclusive, formed the basis of the report of the sterilizing efficiency of neoarsphenamine and have been previously described (4). The minimal curative dose was placed at 30 mg. per kilogram for both brands of neoarsphenamine. It was noted that one brand (F6) failed to cure 1 of 6 rabbits at that dose but, on the other hand, brand F was more effective at 20 mg. than was product E.

The Kahn reaction, being negative in latent experimental syphilis in rabbits, was found to be of little value as a criterion of the curative efficiency of neoarsphenamine in experimental syphilis in rabbits (4) and was discontinued after series 3.

Series 4 to 9, inclusive, represent study of the remaining American brands not previously considered.

With results available of the first 6 series, which showed that 25 mg. per kilogram cured approximately 73 percent of the infected rabbits, an attempt was made in series 7 to replace the 3-dose method with a 1-dose method utilizing the 25 mg. dose. The 1-dose method has been successfully applied to the trypanocidal test by Morrell, Chapman, and Allmark (14). After the one attempt the method was abandoned as it was apparent that information was quite inadequate. In this connection it appeared that one factor which should be investigated was the possible effect of the virulence of the organism on the efficiency of the drug.

In this study the minimal effective dose varied, being 25 mg. per kilogram in series 6 and 7, 40 mg. in series 9, and 30 mg. in all others with the exception of Group 8, for which the curative dose was not definitely determined. It is apparent that each test must be considered independently and compared with the control product, brand E, of each series; no significant difference will then be noted in the sterilizing power of the 17 lots of neoarsphenamine studied.

It is suggested that the variation in the effective dose may be due to changes in the virulence of the organism (15) referred to above rather than to differences in the therapeutic activity of the drug. In support of this observation the results obtained with E-9 and E-10 are offered for consideration. E-9 in series 5 was ineffective at 25 mg. (50 percent), and in series 6 the minimal effective dose was found to be 25 mg.; E-10 in series 7 was effective at 25 mg. (minimal effective dose), whereas in the next series this lot was ineffective at a higher dose of 30 mg.

In the composite protocol of the 9 series the minimal effective dose may be placed at 40 mg. per kilogram, since this dose cured 94 percent of 54 rabbits. The results at lower dosage are as follows: 30 mg. cured 79 percent of 106 rabbits, 25 mg. cured 73 percent of 82 rabbits, and 20 mg. cured 36 percent of 96 rabbits.

The results recorded in this study are in agreement with the observation of Voegtlin and Dyer (7) that the sterilizing action of the arsphenamines depends upon the amount of arsenic injected. The neoarsphenamine of all brands is reasonably uniform in its arsenic content, varying from 18.93 percent (D-3) to a maximum of 21.10 percent (F-9). All neoarsphenamine would therefore be expected to be of approximate sterilizing power if the Voegtlin-Dyer thesis, as it applies to neoarsphenamine, is correct, and according to these results it is.

Also confirming the Voegtlin-Dyer observation (7), the essential relation between dose and sterilizing effect of the arsphenamines in experimental syphilis is recorded in this study by the progressive increase in the percentage of rabbits cured of experimental infection which followed the increased dosage.

#### CONCLUSIONS

The minimal effective dose of neoarsphenamine in experimental syphilis may vary from test to test, due probably to the variable factors in the experimental infection to which the virulence of the organism may contribute rather than to differences in the curative activity of the drug.

Seventeen lots of neoarsphenamine, representing seven American brands, are recorded as being uniformly active in curing experimental syphilis in rabbits with one treatment late in the active stage of the disease.

#### REFERENCES

- (1) Probey, T. F., and McCoy, G. W.: Relation between trypanocidal and spirocheticidal activities of neoarsphenamine. *Pub. Health Rep.*, **45**: 1716 (1930).
- (2) Probey, T. F.: The relation between trypanocidal and spirocheticidal activities of neoarsphenamine. II. The spirocheticidal activity as measured by the prophylactic power of neoarsphenamine. *Pub. Health Rep.*, **47**: 429 (1932).
- (3) Buckholtz, Maurice, and Probey, T. F.: Relation between trypanocidal and spirocheticidal activities of neoarsphenamine. III. Uniformity of effect of different types of neoarsphenamine on the serological reactions in human syphilis. *Pub. Health Rep.*, **48**: 166 (1933).
- (4) Probey, T. F.: The relation between the trypanocidal and spirocheticidal activities of neoarsphenamine. IV. The spirocheticidal activity as measured by the sterilizing efficiency of neoarsphenamine. *Pub. Health Rep.*, **48**: 758 (1933).
- (5) Dale, H. H., and White, C. F.: Report on an experimental and clinical comparison of the therapeutic properties of different preparations of 914. *Lancet*, **202**: 779 (1922).

- (6) Schamberg, J. F., and Kolmer, J. A., with Madden, B.: A comparative study of the toxicity, trypanocidal and spirocheticidal properties of neoarsphenamine of different manufacture with the advisability of establishing standards of curative activity. *J. Am. Med. Assoc.*, **100**: 180 (1933).
- (7) Voegtlin, C., and Dyer, H. A.: Sterilizing efficiency of arsphenamine, neoarsphenamine, and sulfarsphenamine in experimental syphilis. *Pub. Health Rep.*, **42**: 176 (1927).
- (8) Raiziss, G. W., and Severac, M.: Comparative chemotherapeutic studies of "arsenoxide" (3-amino-4-hydroxy-phenyl-arsenoxide) and neoarsphenamine. *Am. J. Syph. and Neurol.*, **19**: 473 (1935).
- (9) Tatum, A. L., and Cooper G. A.: An experimental study of mapharsen (meta-amino para-hydroxy phenyl arsine oxide) as an antisyphilitic agent. *J. Pharm. and Exp. Therap.*, **50**: 198 (1934).
- (10) Raiziss, G. W., and Severac, M.: Therapeutic efficiency of bismarsen in experimental syphilis in rabbits. *Arch. Dermatol. and Syph.*, **28**: 389 (1933).
- (11) Kast, C. C., Peterson, C. W., and Kolmer, J. A.: The treponemicidal activity of arsphenamine and neoarsphenamine *in vitro* with special reference to citrated blood and a suggested method for the prevention of transfusion syphilis. *Am. J. Syph., Gonorr. and Ven. Dis.*, **23**: 150 (1939).
- (12) Eagle, Harry: On the spirocheticidal action of the arsphenamine on *Spirocheta pallida in vitro*. *J. Pharm. and Exp. Therap.*, **64**: 164 (1938).
- (13) Bessemans, A., Van Haelst, J., and DeWilde, H.: An experimental study of the problems of an invisible form of the syphilis virus and of spontaneous spirochetosis in rabbits. *Am. J. Syph. and Neurol.*, **19**: 161 (1935).
- (14) Morrell, C. A., Chapman, C. W., and Allmark, W. G.: On the therapeutic assay of neoarsphenamine with *Trypanosoma equiperdum*. *J. Pharm. and Exp. Therap.*, **64**: 14 (1938).
- (15) Pearce, L.: Specificity of spirochetes in diseases of the eye, ear, nose and throat. *Arch. Otolaryngol.*, **1**: 680 (1925).

## HEMORRHAGIC ADRENAL NECROSIS IN RATS ON DEFICIENT DIETS

By FLOYD S. DAFT, *Biochemist*, and W. H. SEBRELL, *Surgeon, National Institute of Health, United States Public Health Service*

György, Goldblatt, Miller, and Fulton (1) have described a condition in rats on a deficient diet, characterized by granulocytopenia, anemia, and purpura, which they designated "panmyelophthisis." They noted that 24 out of 72 rats with this disease also had hemorrhagic adrenals. Panmyelophthisis could neither be prevented nor cured by a fuller's earth filtrate of a rice bran extract supposed to be rich in the filtrate factor, but it was cured by the watery yeast extract represented by Peter's eluate. György (2) later reported its prevention with nicotinic acid.

Oleson, Bird, Elvehjem, and Hart (3) have described a similar condition in rats characterized by purpura of the paws and nosebleed, but they did not study the blood and therefore were unable to state whether the condition was identical with panmyelophthisis. The adrenals apparently were not studied. They reported that nicotinic acid did not prevent the condition, and expressed the opinion that the dietary factor concerned is adsorbed on fuller's earth along with vitamin B<sub>6</sub> since the condition appeared more frequently when crys-

talline B<sub>6</sub> was fed than when the fuller's earth eluate was used as a supplement.

We have frequently encountered hemorrhagic necrosis of the adrenals in rats on diets deficient in various members of the vitamin B complex during the past few years, yet we have not seen the symptoms of panmyelophthisis described by György and his associates (1) nor the purpura mentioned by Oleson and his associates (3). The experiments herein reported suggest that the hemorrhagic necrosis of the adrenals may be due to a dietary deficiency other than that concerned in panmyelophthisis.

Young albino rats at weaning were given diet 461, which is composed of leached and alcohol extracted casein, 18 percent; cod liver oil, 2 percent; Wesson oil, 3 percent; Osborne and Mendel salt mixture, 4 percent; and sucrose, 73 percent. In addition, all animals began a daily supplement of 20 gamma of riboflavin and 15 gamma of thiamin chloride approximately 2 weeks from the beginning of the experiment when they had stopped gaining weight. Some, but not all, of the rats in the various groups were litter mates.

Because of the difficulty of being certain of the presence or absence of adrenal hemorrhagic necrosis by gross examinations alone, only animals on which the diagnosis was confirmed by histological examination<sup>1</sup> are included in this report.

Eight rats on the above regimen and 4 rats given an additional daily supplement of 1 mg. of nicotinic acid all died in from 30 to 113 days. Four at death had the skin lesions typical of vitamin B<sub>6</sub> deficiency. The remaining 8 died before the usual time of development of these lesions; 6 of the 12 rats had hemorrhagic adrenal necrosis at autopsy, and the adrenals of 1 other animal showed histological evidence of damage followed by repair. According to Dr. Nelson's observations, the bone marrow of 1 rat with normal adrenals showed severe hypoplasia similar to that described by György et al. (1) in panmyelophthisis.

Five rats on the basal ration plus flavin, thiamin, and nicotinic acid were later given a vitamin B<sub>6</sub> concentrate.<sup>2</sup> In 3 the typical skin lesions of vitamin B<sub>6</sub> deficiency were present when the administration of the concentrate was started. All animals were dead after 11 to 29 days of treatment, although the B<sub>6</sub> acrodynia had partially or completely receded at the time of death. All of the rats had nose-bleed and 4 had a sticky exudate on the eyelids. Three of the 5 rats had hemorrhagic adrenal necrosis at autopsy.

<sup>1</sup> All of the histological studies were carried out by Dr. A. A. Nelson, whose observations are included in an accompanying paper in this issue.

<sup>2</sup> The method of Lepkovsky (J. Biol. Chem., 124: 125 (1938)) for the isolation of crystalline B<sub>6</sub> was followed. The concentrate was tested just before and just after the precipitation of the phosphotungstate. Burroughs Wellcome & Co. Ryzamin B was the starting material.

Four rats on the basic diet plus flavin and thiamin were given a daily supplement of 10 gamma of crystalline B<sub>6</sub> after the skin lesions of B<sub>6</sub> deficiency had developed. One also was given a daily supplement of 1 mg. of nicotinic acid. The skin lesions of B<sub>6</sub> deficiency completely disappeared, but all 4 rats died after 25 to 32 days of vitamin B<sub>6</sub> administration. All had nosebleed and 2 had a sticky exudate on the eyelids. Hemorrhagic adrenal necrosis was found in all.

Nine rats on the basic diet plus flavin, thiamin, and nicotinic acid were later given a crude fuller's earth filtrate.<sup>3</sup> This was started after the skin lesions of vitamin B<sub>6</sub> deficiency appeared in 7 of the animals. Similar skin lesions appeared in the remaining 2 animals while receiving the fuller's earth filtrate. Four died showing advanced skin lesions of vitamin B<sub>6</sub> deficiency. The remaining 5 were killed after 12 to 70 days on the fuller's earth filtrate. In 3 of these animals the skin lesions of vitamin B<sub>6</sub> deficiency had subsided.<sup>4</sup> None had symptoms of nosebleed or sticky exudate on the eyelids. No hemorrhagic adrenal necrosis was found in any of the 9 rats. According to Dr. Nelson's report, 2 of these animals showed histological evidence of previous adrenal damage followed by repair.

The relatively small number of animals presented here represents a certain amount of selection because only those histologically examined are included, and the figures therefore should not be interpreted as indicating true percentages of animals with hemorrhagic necrosis of the adrenals in each group.

It seems unlikely that the hemorrhagic adrenal necrosis represents part of the syndrome described by György et al. (1) or by Oleson et al. (3). Blood examinations made less than 24 hours before death on 3 of the rats with extensive adrenal lesions gave normal red and white cell counts in 2 rats. In the third animal the red blood cell count was 3,500,000 and the white cell count 2,150, but there were 64 percent granulocytes. Both György et al. (1) and Oleson et al. (3) note the occurrence of purpura or hemorrhage into the paws. None of our rats showed any evidence of this condition. Although 24 out of 72 of György's rats with panmyelophthisis also had hemorrhagic adrenal necrosis, 48 did not. According to Dr. Nelson's observation, the only rat in our whole series with bone marrow changes typical of panmyelophthisis had normal adrenals, and the chances are rather small that all of our rats with hemorrhagic necrotic adrenals would have died without showing any evidence of panmyelophthisis if the two conditions are due to a deficiency in the same dietary factor.

<sup>3</sup> Burroughs Wellcome Ryzamin B or Eli Lilly Liver Extract No. 343 was treated with fuller's earth in aqueous solution according to the procedure of Lepkovsky, Jukes, and Krause (J. Biol. Chem., 115: 557 (1936)) for the separation of factor 1 from factor 2.

<sup>4</sup> The fuller's earth did not completely remove the vitamin B<sub>6</sub> from this preparation.

## SUMMARY

We have observed extensive hemorrhagic necrosis of the adrenal glands of rats on deficient diets. The condition appears to be due most probably to a deficiency in some unidentified dietary factor. These animals have not shown the purpura or bone marrow changes reported by other investigators in rats on diets deficient in various factors of the vitamin B complex.

It appears unlikely that the hemorrhagic adrenal necrosis is part of the syndrome described as panmyelophthisis, although there is not sufficient evidence to prove conclusively that the two conditions are entirely unrelated.

## REFERENCES

- (1) György, Paul, Goldblatt, Harry, Miller, F. R., and Fulton, R. P.: Panmyelophthisis with hemorrhagic manifestations in rats on a nutritional basis. *J. Exp. Med.*, **66**: 579 (Nov. 1, 1937).
- (2) György, Paul: Nicotinic acid and prevention of nutritional panmyelophthisis in rats. *Proc. Soc. Exp. Biol. and Med.*, **37**: 732 (1938).
- (3) Oleson, J. J., Bird, H. R., Elvehjem, C. A., and Hart, E. B.: Additional nutritional factors required by the rat. *J. Biol. Chem.*, **127**: 23 (1939).

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## HEMORRHAGIC CORTICAL NECROSIS OF ADRENALS IN RATS ON DEFICIENT DIETS<sup>1</sup>

By A. A. NELSON, *Associate Medical Pathologist, United States Public Health Service*

The pathological material studied and reported in this paper was obtained from the 30 rats described in the paper by Daft and Sebrell (1), and from 44 other rats maintained on a variety of diets deficient in some member of the vitamin B complex; both groups showed adrenal and other lesions of the same character. These groups represent the rats selected for histological study out of a larger number of experimental animals, and it must, therefore, be stated that they may not represent the true incidence of the lesions.

Tissues were fixed in Orth's fluid and stained by alum hematoxylin-Romanowsky and iron hematoxylin-Van Gieson methods.

## GROSS PATHOLOGICAL CHANGES

The more marked degrees of hemorrhagic necrosis of the adrenal cortex could easily be seen grossly; the adrenals were swollen and dark; minor degrees of this lesion were difficult to differentiate grossly from simple congestion. The lungs often showed small whitish spots of pneumonic consolidation, and the pleural cavities sometimes contained a little free fluid; the peritoneal cavity did not contain fluid. Blood was seen in the gastrointestinal tract in 5 animals. The other viscera showed no gross lesions. Slight brownish blood staining around

<sup>1</sup> From the Division of Pathology, National Institute of Health.

the nostrils was seen in about one-fourth of the rats. The rat acrodynia characteristic of  $B_6$  deficiency was also seen in about one-fourth of the animals, of which none were in the group given crystalline  $B_6$  supplement.

#### MICROSCOPIC CHANGES IN ADRENALS

Adrenal lesions were found in 44 of the 74 rats, as shown in figures 1 to 4 and in the following table.

TABLE 1.—*Adrenal lesions*

Type of lesion	Number showing cortical lesion	Number of lesions showing calcification	Number of lesions showing pigmented macrophages	Number showing regenerative cortical cells
Very marked hemorrhagic cortical necrosis.....	16	6	2	6
Marked hemorrhagic cortical necrosis.....	6	3	3	1
Moderate hemorrhagic cortical necrosis.....	6	1	2	1
Slight hemorrhagic cortical necrosis.....	4	1	1	0
Marked cortical calcification and fibrosis.....	2	2	2	0
Collagenous zone at corticomedullary junction.....	10	0	7	0
Total.....	44	13	17	8

The hemorrhagic cortical necrosis tended to involve the inner cortex most, and when it was severe (figs. 1-3) only the outer one-third to one-fifth or even less of the cortex was left. Calcification of the necrotic areas tended to involve their peripheries, and when present was usually marked (fig. 1). The collagenous zone (fig. 4) at the corticomedullary junction or in the inner cortex, usually containing moderate numbers of macrophages loaded with hemosiderin, was interpreted as a reparative process after less marked degrees of cortical necrosis. In the adrenals with necrosis, there were often variable, usually slight, degrees of fibroblastic proliferation and collagenization in the necrotic areas. The two adrenals showing marked focal cortical calcification and fibrosis, without necrosis, had undoubtedly undergone necrosis in the past. It is probable that a few adrenals showing small foci of necrosis were missed because only one section of each adrenal was made. One adrenal of each pair was used for paraffin sections and the other for fat stains; lesions were fairly similar in extent within each pair.

In adrenals with cortical necrosis, the remaining cortical cells sometimes differed in appearance from the usual cells in that region; they were smaller, darker, and less regular in outline, and gave the impression that they were regenerating cells. Only the more marked degrees of this change were noted in the table.

The medulla was uninvolved, even in the presence of practically complete hemorrhagic cortical necrosis, except in 2 animals. Here some of the medullary capillaries were thrombosed, but the medullary cells appeared unaffected.

Sudan and Nile blue stains for fat and examination under polarized light were done in 60 of the 74 rats. Space does not permit presentation of the detailed findings, but, in general, the nonnecrotic adrenal cortices showed from moderate to large amounts of sudanophilic material, with the greatest amount toward the periphery, while with Nile blue there was a similar amount and distribution of blue-staining material. Small to moderate and occasionally large amounts of doubly refractile spicular material were present, again with the most in the peripheral cortex. In the necrotic adrenals, the fat distribution was not markedly changed, and in general was moderately reduced in amount; no adrenal was fat free. In the necrotic areas, the fat usually stained violet to pink, instead of blue, with Nile blue.

#### MICROSCOPIC CHANGES IN OTHER ORGANS

These were greatest in the lungs, testes, and skin; in the lungs and testes there was a slight tendency for the most marked lesions to occur in the rats showing the most adrenal necrosis. The liver, kidney, spleen, bone marrow, gastrointestinal tract, pancreas, heart, eye, lower jaw region, and brain showed infrequent, minor, or no lesions.

*Lungs.*—The lungs were examined microscopically in 71 of the 74 animals. Pneumonic processes were present, as shown in table 2. In the lungs with the greatest involvement there was usually a focal bronchopneumonia with predominantly polymorphonuclear cellular exudate, while in some of the less involved lungs there was also interstitial involvement, with more mononuclear leucocytes in the exudate.

TABLE 2.—*Lesions in lungs*

Adrenal lesion	Number of animals	Pneumonia			Lung not examined
		Marked	Slight to moderate	Little or none	
Severe cortical necrosis.....	22	4	5	12	1
Less marked cortical necrosis.....	10	1	1	8	0
Cortical calcification and fibrosis.....	2	0	2	0	0
Collagenous zone at corticomedullary junction.....	10	2	1	6	1
No adrenal lesion; animal died.....	21	2	5	13	1
No adrenal lesion; animal killed.....	9	1	0	8	0
Total.....	74	10	14	47	3

*Testes.*—The testes were examined in 29 animals. In general, there was a marked reduction in spermatogenesis, together with the presence of other signs of damage such as teratocytes (multinucleated and atypical spermatids), necrotic tubular cells, dilatation of the epididymal tubules and the presence in these tubules of macrophages and desquamated spermatogenetic cells. All animals except one (75 days) in which the testes were examined were from 100 to 200 days of age at the time of death and should, therefore, have shown numerous

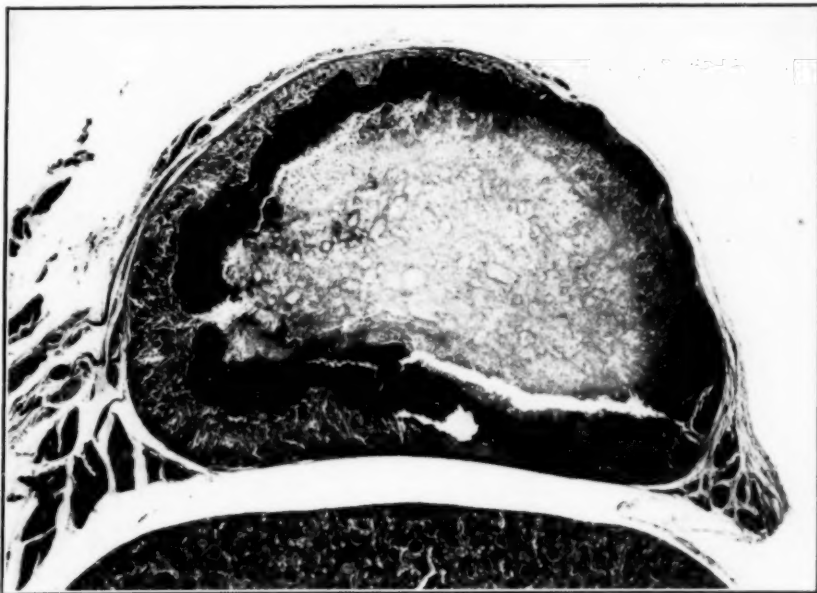


FIGURE 1.—Adrenal showing nearly complete hemorrhagic cortical necrosis, with marked peripheral calcification of the necrotic area. The atypical appearance of the remaining or regenerated cortical cells can be made out. This section is cut slightly off center and the medulla is not seen.  $\times 14$ .

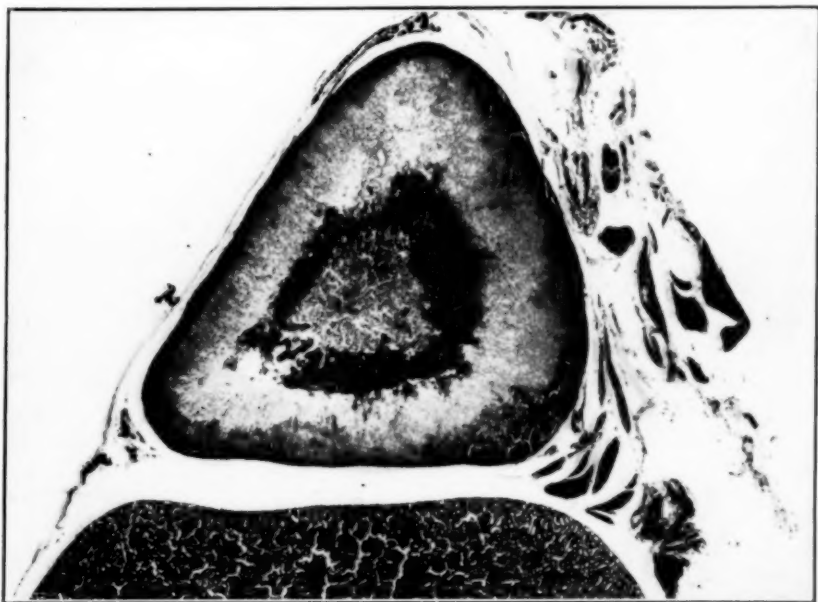


FIGURE 2.—Nearly complete hemorrhagic cortical necrosis. From within outward can be seen the intact medulla, a darker zone of hemorrhage, a lighter zone of necrotic debris, and a darker hemorrhagic peripheral zone containing a few viable cortical cells. The medulla gave a normal chromaffin reaction.  $\times 12$ .

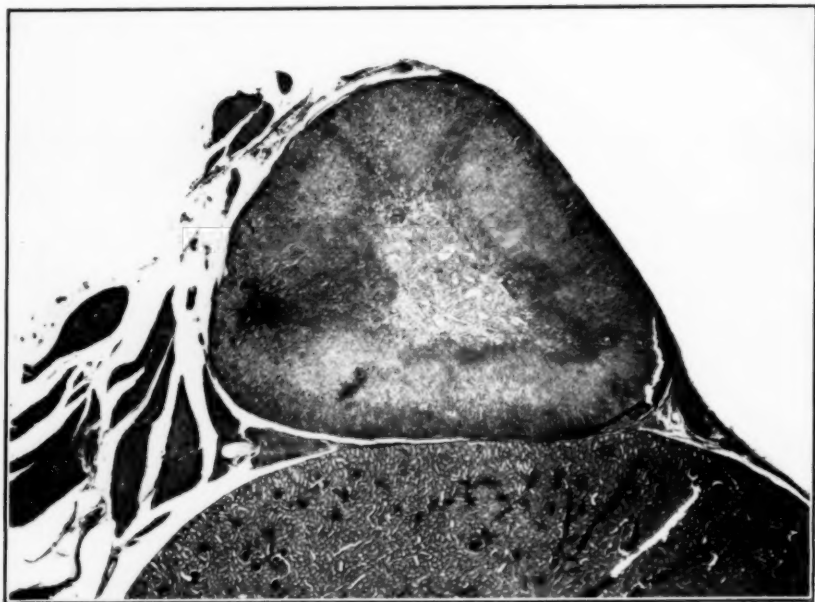


FIGURE 3.—Zones as for figure 2. The necrosis is not quite as complete.  $\times 12$ .

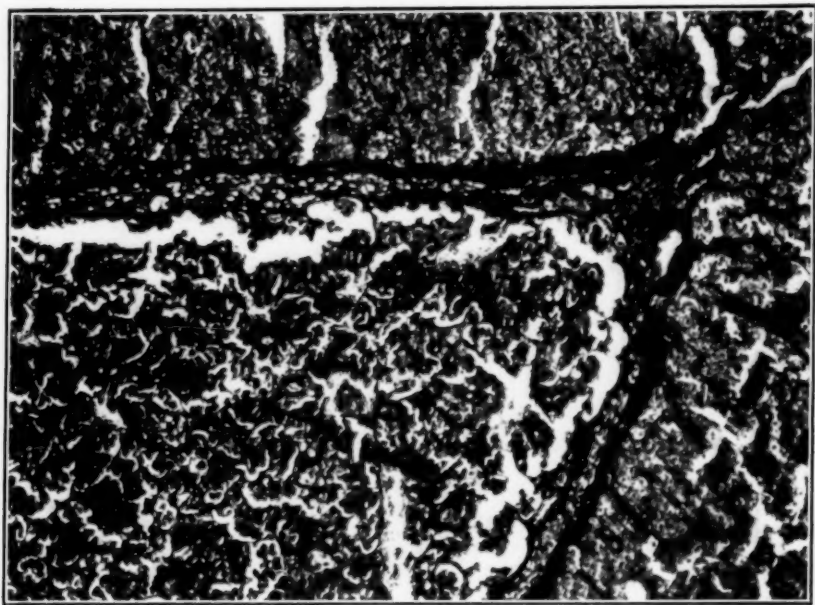


FIGURE 4.—Collagenous zone between medulla (lower left) and cortex.  $\times 98$ .

spermatozoa in the testes. The numbers of spermatozoa found are shown in table 3.

TABLE 3.—Numbers of spermatozoa in testes

Adrenal lesion	Spermatozoa				Degen- erated tubular cells	Terato- cytes	Dilated tubules and desquamated cells in epi- didymis <sup>1</sup>
	None	Few	Moderate number	Many			
Severe cortical necrosis .....	8	0	1	0	2	5	4
Less marked cortical necrosis .....	4	0	2	0	4	1	4
Collagenous zone at cortico- medullary junction .....	3	0	0	1	0	2	1
No necrosis .....	5	1	0	4	2	5	3
Total .....	20	1	3	5	8	13	12

<sup>1</sup> Not all of the epididymides were sectioned.

<sup>2</sup> Only 1 of these occurred among the 4 testes with numerous spermatozoa.

*Skin.*—Sections of skin from one of the paws were examined in 7 animals which at the time of death showed B<sub>6</sub> dermatitis; only one of these was from an animal showing severe adrenal cortical necrosis. In all 7 cases there was more or less necrosis and ulceration of the epidermis, with massive polymorphonuclear infiltration in the corium underneath. Skin from around the nose and mouth was examined in 5 animals; one showed focal ulceration with polymorphonuclear leucocytes underneath. In 14 animals skin from over the tibia was examined; 3 showed minor focal inflammatory changes and one moderate focal ulceration with numerous polymorphonuclears underneath.

*Liver.*—The liver was examined microscopically in all 74 animals; in 51 of these, Sudan and Nile blue fat stains were done and sections were examined by polarized light. In general, the changes were rather minor. Of the 74 livers, 51 were fat free or practically so, 12 showed slight to moderate amounts of fat in the hepatic cells, 8 showed a relatively large amount of fat in the Kupffer cells (in 2 of these the fat consisted chiefly of doubly refractile material), and 3 showed slight or moderate amounts of fat in the hepatic cells and much (relatively) in the Kupffer cells. Except for the 2 livers mentioned, doubly refractile material was absent or practically so. In the 9 livers showing much isotropic fat in the Kupffer cells, the fat globules were large, and not as sudanophilic as the fat in the hepatic cells, and also stained light tints of green or yellow with the hematoxylin-Romanowsky stain. A test for iron done on one of these animals showed that the Kupffer cells contained a moderate number of hemosiderin granules in addition to the fat, and more extensive iron tests on previous series of animals have shown that hemosiderin is usually present together with the large fat globules. The significance of this type of pigmentation is not known.

Slight atrophy was seen in 13 livers, and 2 showed minor focal necroses.

*Kidney.*—The kidney was examined microscopically in all except 1 of the 74 rats; Sudan and Nile blue stains for fat and examination of frozen sections by polarized light were done in 43. As in the liver, the lesions were minor. Of the 73 kidneys, 47 were fat free or practically so, 22 were fat free except for the presence of varying numbers of black crosses of polarization, sometimes together with a little spicular anisotropic material, in or toward the lumens of the convoluted tubules, and 5 showed small amounts of sudanophilic material in the convoluted tubules (none of these 5 showed spicular anisotropic material; 1 showed black crosses of polarization). Two kidneys were moderately hydro-nephrotic; 5 contained small numbers of hyaline to calcified tubular casts; 2 showed slight hyaline granulation of the convoluted tubule epithelium; 1 fat-free kidney showed moderate vacuolation of the convoluted tubule epithelium; 1 kidney contained a few small old foci of atrophy; and 1 showed a focal suppurative pyelonephritis. Most of the kidney lesions probably had little connection with the experimental procedure, and about the same number would probably be seen in 74 untreated rats of the same age.

*Spleen.*—The spleen was examined microscopically in 72 of the 74 rats. There were no outstanding findings; the spleens showed the usual marked variations in follicular size, prominence of follicle reticulum cells, perifollicular and peritrabecular hyperplasia, and myelopoiesis that any large group of rat spleens will show. A majority of the animals, however, showed excess amounts of hemosiderin. Hemosiderin was considered present within normal limits in 22, in slight excess in 42, in marked excess in 7, and present in unusually large amount in 1. Perls' reaction for ferric iron was done on 10 of these spleens.

*Bone marrow and bones.*—These structures were of special interest inasmuch as György et al. (2) have reported adrenal lesions similar to ours, together with a panmyelophthisis, on a nutritional basis. Sections were made of all or most of the tibia together with the lower part of the femur in 61 of the 74 rats. In only 1 animal (this animal showed no adrenal lesion) was there a markedly hypoplastic marrow, similar to those illustrated by György. Two marrows showed slight hyperplasia and 5 slight hypoplasia. Fourteen marrows, 12 of normal cellularity and 2 slightly hypoplastic, showed slight relative increases of certain cell lines; the granulocytic line was increased in 5, the megakaryocytes in 5, normoblasts in 2, and stem cells in 2. Some of these marrows might well be within the normal range of variation.

The bone itself was within normal limits in all 61 rats. One rat showed a small subperiosteal hemorrhage. The voluntary muscles

around the bones were normal except for 2 animals with a few small foci of coagulation necrosis (3).

*Gastrointestinal tract.*—In 5 animals, blood was noted grossly in the gastrointestinal tract. The stomach was examined microscopically in 38 animals, the duodenum in 23, the small intestine in 47, the colon in 17, and the pancreas in 57. Five rats showed slight to moderate focal lymphocyte and polymorphonuclear infiltration of the lamina propria of the stomach, especially in the pyloric region; 1 of these had gross blood in the gastrointestinal tract. The duodenum was negative in all examined. The small intestine in one animal showed slight perivascular macrophage accumulation in the submucosa; one colon showed a 1-mm. abscess in the submucosa; the other small and large intestines were negative. All sections of pancreas were negative.

*Heart.*—Only 3 of the 54 hearts examined showed lesions; there was one each of the following myocardial lesions in minor degree—fatty change, focal polymorphonuclear infiltration, and focal coagulation necrosis.

*Eye.*—Sixteen eyes were examined; the cornea, conjunctiva, iris, ciliary body, lens, retina, choroid, and sclera in all were free from lesions.

*Lower jaw region.*—A cross section including the tongue, the molar and incisor teeth and their supporting structures, and the jawbone, was made in 9 animals and showed no lesions except in 1 animal with a recent infarcted area on the dorsum of the tongue.

*Brain.*—This was sectioned in 3 animals, in each case at several levels. There were no lesions.

#### COMMENT

Hemorrhagic cortical necrosis of the rat adrenal is an uncommon lesion. Löwenthal (4), who states that the pathology of the adrenal in the common laboratory animals has scarcely been investigated, mentions that adrenal hemorrhages and fibroses occur in mice subjected to various infections. Adrenal necroses have been reported from this Institute in vaccinia and vibriosis septique toxicosis in rabbits and other small animals (5, 6). Also, Dr. R. D. Lillie of this Institute, in studying a series (unpublished) of guinea pigs with carbon tetrachloride poisoning, frequently found minor to marked degrees of adrenal cortical necrosis, involving chiefly the inner zone; calcification was not noted.

György et al. (2) in an excellently illustrated article describe a panmyelophthisis, cutaneous and splenic hemorrhages, and necrosis of the adrenals in rats on a deficient diet. The diet caused the appearance of acrodynia in from 6 to 20 weeks. Then, treatment with purified B<sub>6</sub> preparations was followed by anemia and a hemor-

rhagic diathesis, while treatment with more complex B<sub>6</sub> preparations or with milk, liver, and yeast eventually cured the acrodynia without the complication of abnormal hematopoiesis. The panmyelophthisis was not found by us except in 1 animal, as mentioned in the description of the bone marrow, and this animal had normal adrenals. The cutaneous hemorrhages and perifollicular splenic hemorrhages described and illustrated by György et al. were not seen by us, although a few of our animals showed melena, and about one-fourth slight nosebleeds. These authors examined microscopically the testes of 2 of their rats (ages not stated) and found some hemorrhage and no spermatozoa.

#### CONCLUSIONS

The hemorrhagic cortical necrosis of the adrenals and other lesions found in rats on diets deficient in some fraction of the vitamin B complex are described.

The panmyelophthisis which György et al. found to occur together with hemorrhagic necrosis of the adrenals in a large proportion of their rats was found in only 1 rat in this series, and this animal had no adrenal lesions.

#### REFERENCES

- (1) Daft, Floyd S., and Sebrell, W. H.: Hemorrhagic adrenal necrosis in rats on deficient diets. Preceding paper in this issue of Public Health Reports.
- (2) György, Paul, Goldblatt, Harry, Miller, Franklin R., and Fulton, Robert P.: Panmyelophthisis with hemorrhagic manifestations in rats on a nutritional basis. *J. Exp. Med.*, **66**: 579-602 (1937).
- (3) Pappenheimer, A. M.: The pathology of nutritional muscular dystrophy in young rats. *Am. J. Path.*, **15**: 179-183 (1939).
- (4) Löwenthal, Karl, in Jaffé, Rudolf: *Anatomie und Pathologie der Spontanerkrankungen der kleinen Laboratoriumstiere*. Berlin, Julius Springer (1931).
- (5) Lillie, Ralph D., and Armstrong, Charles: The pathology of generalized vaccinia in rabbits. National Institute of Health Bulletin No. 156, United States Government Printing Office (1930).
- (6) Pasternack, Joseph G., and Bengtson, Ida A.: The experimental pathology and pathologic histology produced by the toxin of vibrión septique in animals. National Institute of Health Bulletin No. 168, United States Government Printing Office (1936).

### DEATHS DURING WEEK ENDED DECEMBER 2, 1939

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Dec. 2, 1939	Correspond- ing week, 1938
<b>Data from 88 large cities of the United States:</b>		
Total deaths.....	8,541	8,934
Average for 3 prior years.....	<sup>1</sup> 8,751	
Total deaths, first 48 weeks of year.....	395,035	389,091
Deaths under 1 year of age.....	521	547
Average for 3 prior years.....	<sup>1</sup> 539	
Deaths under 1 year of age, first 48 weeks of year.....	23,835	25,117
<b>Data from industrial insurance companies:</b>		
Policies in force.....	66,535,899	68,314,781
Number of death claims.....	12,371	12,385
Death claims per 1,000 policies in force, annual rate.....	9.7	9.5
Death claims per 1,000 policies, first 48 weeks of year, annual rate.....	9.9	9.2

<sup>1</sup> Data for 86 cities.

# PREVALENCE OF DISEASE

*No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring*

## UNITED STATES

### CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers.

In these and the following tables, a zero (0) indicates a positive report and has the same significance as any other figure, while leaders (—) represent no report with the implication that cases or deaths may have occurred but were not reported to the State health officer.

*Cases of certain diseases reported by telegraph by State health officers for the week ended Dec. 9, 1939, rates per 100,000 population (annual basis), and comparison with corresponding week of 1938 and 5-year median*

Division and State	Diphtheria				Influenza				Measles			
	Dec. 9, 1939, rate	Dec. 9, 1939, cases	Dec. 10, 1938, cases	1934-38, median	Dec. 9, 1939, rate	Dec. 9, 1939, cases	Dec. 10, 1938, cases	1934-38, median	Dec. 9, 1939, rate	Dec. 9, 1939, cases	Dec. 10, 1938, cases	1934-38, median
<b>NEW ENG.</b>												
Maine.....	6	1	21	4	60	10	1	1	241	40	5	33
New Hampshire.....	0	0	1	0	—	—	—	—	41	4	1	2
Vermont.....	0	0	0	2	—	—	—	—	308	23	2	2
Massachusetts.....	4	3	6	6	—	—	—	—	381	324	192	117
Rhode Island.....	8	1	0	0	—	—	—	—	611	80	2	3
Connecticut.....	0	0	2	4	15	5	5	5	137	46	75	75
<b>MID. ATL.</b>												
New York.....	5	12	35	36	18	112	114	113	204	509	707	496
New Jersey.....	18	15	19	19	11	9	8	14	19	16	11	33
Pennsylvania.....	15	29	52	70	—	—	—	—	19	37	76	109
<b>E. NO. CEN.</b>												
Ohio.....	34	44	68	68	11	14	—	11	10	13	20	72
Indiana.....	36	24	20	33	18	12	9	36	12	8	14	24
Illinois.....	30	46	41	41	5	8	8	22	16	24	28	32
Michigan <sup>1</sup> .....	6	6	21	25	6	6	1	2	286	271	173	161
Wisconsin.....	2	1	3	5	—	—	20	27	91	52	149	70
<b>W. NO. CEN.</b>												
Minnesota.....	2	1	18	7	4	2	6	1	83	43	296	57
Iowa.....	22	11	8	8	30	15	4	3	32	16	81	6
Missouri.....	18	14	17	37	3	2	21	58	5	4	6	8
North Dakota.....	15	2	4	2	7	1	14	8	124	17	53	5
South Dakota.....	30	4	7	1	8	1	2	—	0	0	84	4
Nebraska.....	8	2	1	5	—	—	—	—	4	1	4	4
Kansas.....	11	4	15	15	28	10	11	9	268	90	7	14
<b>SO. ATL.</b>												
Delaware.....	0	0	2	1	—	—	—	—	39	2	—	3
Maryland <sup>1</sup> .....	22	7	18	19	37	12	13	13	19	6	72	72
Dist. of Col. <sup>1</sup> .....	16	2	9	11	—	—	4	3	8	1	1	5
Virginia <sup>2</sup> .....	103	55	63	57	247	132	176	—	45	24	33	33
West Virginia.....	48	18	31	31	43	16	18	24	5	2	15	15
North Carolina <sup>1</sup> .....	149	102	72	73	37	25	5	7	203	139	288	288
South Carolina <sup>1</sup> .....	68	25	11	11	3,679	1,347	423	377	16	6	4	4
Georgia <sup>2</sup> .....	60	36	12	23	353	214	99	—	13	8	33	0
Florida <sup>2</sup> .....	36	12	11	19	18	6	5	2	0	0	13	5

See footnotes at end of table.

Cases of certain diseases reported by telegraph by State health officers for the week ended Dec. 9, 1939, rates per 100,000 population (annual basis), and comparison with corresponding week of 1938 and 5-year median—Continued

Division and State	Diphtheria				Influenza				Measles			
	Dec. 9, 1939, rate	Dec. 9, 1939, cases	Dec. 10, 1938, cases	1934-38, median	Dec. 9, 1939, rate	Dec. 9, 1939, cases	Dec. 10, 1938, cases	1934-38, median	Dec. 9, 1939, rate	Dec. 9, 1939, cases	Dec. 10, 1938, cases	1934-38, median
<b>E. SO. CEN.</b>												
Kentucky.....	38	22	20	35	10	6	54	34	5	3	7	7
Tennessee <sup>1</sup> .....	39	22	19	38	39	22	53	59	49	28	12	12
Alabama <sup>1</sup> .....	67	38	27	29	820	466	124	124	25	14	48	17
Mississippi <sup>1</sup> .....	61	21	12	12								
<b>W. SO. CEN.</b>												
Arkansas.....	64	26	18	15	246	99	116	54	5	2	18	2
Louisiana <sup>1</sup> .....	19	8	13	30	17	7	12	12	0	0	26	8
Oklahoma.....	34	17	26	24	227	113	125	60	8	4	28	3
Texas <sup>1</sup> .....	37	45	67	79	367	443	332	332	36	43	14	18
<b>MOUNTAIN</b>												
Montana.....	9	1	2	2	6,403	684	6	6	178	19	237	11
Idaho.....	0	0	0	1			8	1	245	24	56	13
Wyoming.....	44	2	8	1	1,134	52			131	6	1	1
Colorado.....	53	11	16	9	559	116	24		82	17	9	9
New Mexico.....	62	5	4	4			1		12	1	5	13
Arizona.....	98	8	8	6	1,055	86	172	65	37	3	0	2
Utah <sup>1</sup> .....	20	2	1	0	2,940	296	28		516	52	23	20
<b>PACIFIC</b>												
Washington.....	0	0	6	3					1,166	378	248	75
Oregon.....	5	1	1	1	283	57	23	23	169	34	14	14
California <sup>1</sup> .....	25	31	60	43	16	19	37	46	110	134	872	124
Total.....	29	740	896	993	204	4,325	1,984	1,701	104	2,574	4,063	4,063
49 weeks.....	18	22,564	28,034	28,034	163	169,793	60,673	114,129	302	366,393	785,071	704,673

Division and State	Meningitis, meningococcus				Poliomyelitis				Scarlet fever			
	Dec. 9, 1939, rate	Dec. 9, 1939, cases	Dec. 10, 1938, cases	1934-38, median	Dec. 9, 1939, rate	Dec. 9, 1939, cases	Dec. 10, 1938, cases	1934-38, median	Dec. 9, 1939, rate	Dec. 9, 1939, cases	Dec. 10, 1938, cases	1934-38, median
<b>NEW ENG.</b>												
Maine.....	0	0	0	0	6	1	0	0	48	8	11	13
New Hampshire.....	0	0	0	0	0	0	0	0	10	1	10	10
Vermont.....	0	0	0	0	0	0	0	0	80	6	4	14
Massachusetts.....	0	0	2	2	2.4	2	0	0	99	84	87	153
Rhode Island.....	8	1	0	0	0	0	0	0	84	11	4	20
Connecticut.....	3	1	0	0	3	1	0	0	128	43	44	41
<b>MID. ATL.</b>												
New York.....	0.8	2	2	7	2.4	6	2	2	121	302	103	405
New Jersey.....	1.2	1	0	1	2.4	2	1	1	264	222	79	103
Pennsylvania.....	1	2	3	5	1.5	3	0	2	158	312	260	438
<b>E. NO. CEN.</b>												
Ohio.....	0	0	1	3	0.8	1	1	2	305	397	338	379
Indiana.....	4	3	0	1	1.5	1	0	0	205	138	143	181
Illinois.....	1.3	2	1	3	0.7	1	1	1	207	316	324	512
Michigan <sup>1</sup> .....	0	0	4	2	3	3	0	1	301	285	492	406
Wisconsin.....	0	0	1	1	5	3	0	1	178	101	155	200
<b>W. NO. CEN.</b>												
Minnesota.....	0	0	0	1	6	3	0	0	229	118	105	140
Iowa.....	0	0	0	1	18	9	0	1	126	62	58	92
Missouri.....	0	0	1	1	0	0	1	1	113	88	122	132
North Dakota.....	0	0	1	0	0	0	1	0	190	26	26	41
South Dakota.....	0	0	0	0	0	0	0	0	135	18	33	33
Nebraska.....	0	0	0	0	0	0	0	0	76	20	26	40
Kansas.....	2.8	1	0	1	6	2	0	0	358	128	153	153

See footnotes at end of table.

Cases of certain diseases reported by telegraph by State health officers for the week ended Dec. 9, 1939, rates per 100,000 population (annual basis), and comparison with corresponding week of 1938 and 5-year median—Continued

Division and State	Meningitis, meningococcus				Poliomyelitis				Scarlet fever			
	Dec. 9, 1939, rate	Dec. 9, 1939, cases	Dec. 10, 1938, cases	1934-38, median	Dec. 9, 1939, rate	Dec. 9, 1939, cases	Dec. 10, 1938, cases	1934-38, median	Dec. 9, 1939, rate	Dec. 9, 1939, cases	Dec. 10, 1938, cases	1934-38, median
<b>SO. ATL.</b>												
Delaware.....	0	0	0	0	20	1	0	0	433	22	12	10
Maryland <sup>1</sup> &	6	2	0	2	6	2	0	0	154	50	51	87
Dist. of Col.....	0	0	0	0	0	0	0	0	16	2	7	12
Virginia <sup>2</sup> .....	0	0	1	5	1.9	1	1	1	129	69	46	55
West Virginia.....	2.7	1	2	3	0	0	0	0	245	91	49	92
North Carolina <sup>3</sup> .....	2.9	2	0	2	0	0	1	2	165	113	88	87
South Carolina <sup>3</sup> .....	2.7	1	0	0	11	4	0	0	68	25	11	6
Georgia <sup>2</sup> .....	0	0	0	0	1.7	1	2	1	63	38	19	24
Florida <sup>2</sup> .....	3	1	0	0	0	0	0	0	27	9	21	10
<b>E. SO. CEN.</b>												
Kentucky.....	0	0	3	3	17	10	0	1	118	68	89	68
Tennessee <sup>2</sup> .....	4	2	2	1	0	0	1	2	132	75	32	45
Alabama <sup>2</sup> .....	1.8	1	2	2	0	0	3	1	88	50	33	30
Mississippi <sup>2</sup> .....	2.5	1	0	0	5	2	0	0	46	18	13	19
<b>W. SO. CEN.</b>												
Arkansas.....	0	0	0	0	5	2	0	0	40	16	19	14
Louisiana <sup>2</sup> .....	0	0	1	0	2.4	1	0	2	44	18	23	17
Oklahoma.....	2	1	0	0	2	1	1	1	36	18	56	35
Texas <sup>2</sup> .....	0.8	1	3	0	3	4	0	4	46	56	113	100
<b>MOUNTAIN</b>												
Montana.....	0	0	0	0	0	0	0	0	393	42	16	30
Idaho.....	0	0	2	0	10	1	0	0	102	10	24	33
Wyoming.....	0	0	0	0	0	0	0	0	349	16	3	16
Colorado.....	5	1	1	14	3	3	0	0	217	45	49	49
New Mexico.....	0	0	0	0	0	0	1	1	247	20	21	21
Arizona.....	0	0	0	1	0	0	0	0	98	8	4	12
Utah <sup>2</sup> .....	0	0	0	0	50	5	0	0	179	18	28	38
<b>PACIFIC</b>												
Washington.....	3	1	0	1	0	0	1	1	89	29	72	67
Oregon.....	10	2	0	0	5	1	2	0	154	31	51	54
California <sup>2</sup> .....	0	0	1	3	17	21	4	6	157	191	214	228
Total.....	1.2	30	34	73	4	98	24	56	153	3,834	3,741	5,022
49 weeks.....	1.5	1,851	2,700	3,146	6	7,134	1,657	7,147	123	151,214	175,202	209,505

Division and State	Smallpox				Typhoid and paratyphoid fever				Whooping cough		
	Dec. 9, 1939, rate	Dec. 9, 1939, cases	Dec. 10, 1938, cases	1934-38, median	Dec. 9, 1939, rate	Dec. 9, 1939, cases	Dec. 10, 1938, cases	1934-38, median	Dec. 9, 1939, rate	Dec. 9, 1939, cases	Dec. 10, 1938, cases
<b>NEW ENG.</b>											
Maine.....	0	0	0	0	0	0	2	2	320	53	79
New Hampshire.....	0	0	0	0	20	2	0	0	71	7	2
Vermont.....	0	0	0	0	0	0	0	0	764	57	61
Massachusetts.....	0	0	0	0	2	2	0	1	160	136	177
Rhode Island.....	0	0	0	0	0	0	1	0	122	16	44
Connecticut.....	0	0	0	0	6	2	0	1	291	98	106
<b>MID. ATL.</b>											
New York.....	0	0	0	0	2	6	6	7	108	494	604
New Jersey.....	0	0	0	0	8	7	1	1	167	140	384
Pennsylvania.....	0	0	0	0	4	7	5	19	154	303	419

See footnotes at end of table.

Cases of certain diseases reported by telegraph by State health officers for the week ended Dec. 9, 1939, rates per 100,000 population (annual basis), and comparison with corresponding week of 1938 and 5-year median—Continued

Division and State	Smallpox				Typhoid and paratyphoid fever				Whooping cough		
	Dec. 9, 1939, rate	Dec. 9, 1939, cases	Dec. 10, 1938, cases	1934-38 median	Dec. 9, 1939, rate	Dec. 9, 1939, cases	Dec. 10, 1938, cases	1934-38 median	Dec. 9, 1939, rate	Dec. 9, 1939, cases	Dec. 10, 1938, cases
<b>E. NO. CEN.</b>											
Ohio.....	1	1	2	0	7	9	0	4	101	132	140
Indiana.....	4	3	41	3	1	1	1	2	94	63	20
Illinois.....	3	5	0	2	6	9	7	10	73	112	595
Michigan <sup>1</sup> .....	1	1	5	0	1	1	8	5	138	131	332
Wisconsin.....	11	6	11	7	0	0	3	3	193	110	486
<b>W. NO. CEN.</b>											
Minnesota.....	62	32	16	14	2	1	0	0	101	52	38
Iowa.....	20	10	13	10	0	0	7	3	111	55	12
Missouri.....	6	5	11	3	3	2	5	10	18	14	27
North Dakota.....	0	0	0	1	0	0	1	0	95	13	8
South Dakota.....	15	2	11	11	0	0	0	0	8	1	2
Nebraska.....	0	0	3	3	0	0	1	1	46	12	11
Kansas.....	0	0	0	5	8	3	0	1	75	27	20
<b>SO. ATL.</b>											
Delaware.....	0	0	0	0	20	1	1	1	315	16	13
Maryland <sup>2,3</sup> .....	0	0	0	0	19	6	5	4	170	55	48
Dist. of Col.....	0	0	0	0	8	1	0	2	81	10	20
Virginia <sup>3</sup> .....	0	0	0	0	4	2	4	7	73	39	40
West Virginia.....	0	0	0	0	30	11	5	5	38	14	22
North Carolina <sup>3</sup> .....	1	1	0	0	7	5	1	4	130	89	227
South Carolina <sup>3</sup> .....	0	0	0	0	11	4	2	1	33	12	47
Georgia <sup>3</sup> .....	0	0	1	1	7	4	3	4	33	20	14
Florida <sup>3</sup> .....	0	1	0	0	3	1	8	2	6	2	21
<b>E. SO. CEN.</b>											
Kentucky.....	0	0	0	0	5	3	3	9	78	45	37
Tennessee <sup>3</sup> .....	0	0	0	0	12	7	1	7	78	44	12
Alabama <sup>3</sup> .....	0	0	0	0	0	0	4	2	23	13	46
Mississippi <sup>3</sup> .....	0	0	0	0	8	3	0	7			
<b>W. SO. CEN.</b>											
Arkansas.....	5	2	2	1	7	3	5	5	12	5	19
Louisiana <sup>3</sup> .....	2	1	0	0	12	5	4	8	70	29	9
Oklahoma.....	12	6	19	2	14	7	6	8	2	1	13
Texas <sup>3</sup> .....	5	6	5	2	9	11	26	24	48	58	33
<b>MOUNTAIN</b>											
Montana.....	9	1	4	25	0	0	0	1	56	6	37
Idaho.....	0	0	16	1	10	1	2	2	0	0	0
Wyoming.....	0	0	0	2	0	0	2	1	262	12	1
Colorado.....	140	29	23	22	0	0	3	0	48	10	21
New Mexico.....	0	0	0	0	62	5	3	7	445	36	31
Arizona.....	0	0	5	0	37	3	0	0	25	2	4
Utah <sup>3</sup> .....	10	1	0	0	30	3	0	0	944	95	16
<b>PACIFIC</b>											
Washington.....	0	0	3	30	15	5	1	1	52	17	26
Oregon.....	10	2	5	5	10	2	1	2	174	85	23
California <sup>3</sup> .....	3	4	3	3	5	6	5	9	121	148	99
Total.....	5	119	199	199	6	151	143	225	115	2,839	4,536
49 weeks.....	8	9,280	13,885	6,994	10	12,416	13,858	14,699	137	165,667	199,511

<sup>1</sup> New York City only.

<sup>2</sup> Period ended earlier than Saturday.

<sup>3</sup> Typhus fever, week ended December 9, 1939, 76 cases as follows: Maryland, 1; Virginia, 1; North Carolina, 5; South Carolina, 4; Georgia, 29; Florida, 1; Tennessee, 14; Alabama, 7; Louisiana, 6; Texas, 7; California, 1.

## SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week.

State	Diph- theria	Influ- enza	Ma- laria	Mea- sles	Menin- gitis, menin- gococ- cus	Pel- lagra	Polio- mye- litis	Scarlet fever	Small- pox	Ty- phoid and paraty- phoid fever
<i>February 1939</i>										
New Hampshire	0	3		19	0		0	24	0	0
<i>June 1939</i>										
New Hampshire	1			1	0		0	7	0	1
<i>July 1939</i>										
New Hampshire				79	0		0	2	0	1
South Carolina	86	488	2, 159	27	0	243	93	15	0	125
<i>August 1939</i>										
New Hampshire	0			28	0		0	2	0	4
South Carolina	224	471	1, 571	6	0	118	61	21	1	47
<i>September 1939</i>										
Massachusetts	15		3	78	2	2	20	99	0	15
Nevada	0			1	1		0	6	0	8
New Hampshire	0			12	0		4	5	0	1
South Carolina	270	742	1, 912	13	0	160	36	56	1	59
<i>October 1939</i>										
Alaska	0			349	0		0	0	0	0
New Hampshire	0			26	0		0	9	0	0
South Carolina	375	752	1, 193	4	1	122	15	65	0	37
Wisconsin	5	109		107	6		28	503	5	3
<i>November 1939</i>										
Connecticut	1	9		138	1		1	143	0	7
Delaware	3	4		8	1		1	82	0	7
Iowa	32	1		73	3		62	303	34	2
Missouri	55	1	2	43	2		2	258	2	25
New Hampshire	0			27	0		0	3	0	1
Texas	205	908	208	158	9	66	21	186	12	62
West Virginia	69	33		17	7		18	353	0	29
Wyoming	8	1		69	0		1	30	1	1

<i>February 1939</i>		<i>August 1939</i>		<i>September 1939—Continued</i>	
New Hampshire:	Cases	New Hampshire:	Cases	Dengue:	Cases
Chickenpox	19	Chickenpox	1	South Carolina	5
Mumps	3	Mumps	3	Diarrhea:	
Whooping cough	7	Whooping cough	7	South Carolina	649
<i>July 1939</i>		South Carolina:		Dysentery:	
New Hampshire:		Chickenpox	13	Massachusetts (bacil- lary)	56
Chickenpox	3	Dengue	19	Encephalitis, epidemic or lethargic:	
Mumps	7	Diarrhea	603	Massachusetts	1
Whooping cough	28	Dysentery, amoebic	1	German measles:	
South Carolina:		German measles	2	Massachusetts	20
Chickenpox	36	Hookworm disease	106	South Carolina	5
Diarrhea	1, 666	Mumps	36	Hookworm disease:	
German measles	3	Ophthalmia neonata- torum	4	South Carolina	127
Hookworm disease	135	Rabies in animals	17	Mumps:	
Mumps	101	Tetanus	1	Massachusetts	57
Ophthalmia neonata- torum	7	Tularaemia	1	Nevada	8
Rabies in animals	10	Typhus fever	35	South Carolina	36
Septic sore throat	1	Undulant fever	10	Ophthalmia neonatorum:	
Tetanus	5	Vincent's infection	3	Massachusetts	112
Tularaemia	1	Whooping cough	99	South Carolina	7
Typhus fever	9	<i>September 1939</i>		Rabies in animals:	
Undulant fever	12	Chickenpox:		Massachusetts	6
Whooping cough	224	Massachusetts	87	South Carolina	12
		South Carolina	22	Septic sore throat:	
				Massachusetts	3
				South Carolina	3

## Summary of monthly reports from States—Continued

September 1939—Continued		October 1939—Continued		November 1939—Continued	
	Cases		Cases		Cases
Tetanus:		Tularaemia:		Mumps—Continued.	
Massachusetts.....	2	Wisconsin.....	1	West Virginia.....	1
South Carolina.....	3	Typhus fever:		Wyoming.....	74
Tularaemia:		South Carolina.....	32	Ophthalmia neonatorum:	
Massachusetts.....	1	Undulant fever:		Texas.....	1
South Carolina.....	1	South Carolina.....	1	Rabies in animals:	
Typhus fever:		Wisconsin.....	2	Iowa.....	3
South Carolina.....	45	Whooping cough:		Relapsing fever:	
Undulant fever:		New Hampshire.....	5	Texas.....	1
Massachusetts.....	1	South Carolina.....	51	Rocky Mountain spotted	
New Hampshire.....	2	Wisconsin.....	656	fever:	
South Carolina.....	1			Delaware.....	1
Whooping cough:		November 1939		Septic sore throat:	
Massachusetts.....	401	Chickenpox:		Connecticut.....	17
Nevada.....	3	Connecticut.....	334	Iowa.....	6
New Hampshire.....	6	Delaware.....	47	Missouri.....	6
South Carolina.....	93	Iowa.....	299	West Virginia.....	2
October 1939		Missouri.....	76	Wyoming.....	1
Chickenpox:		New Hampshire.....	65	Trachoma:	
Alaska.....	5	Texas.....	182	Missouri.....	4
New Hampshire.....	4	West Virginia.....	115	Texas.....	6
South Carolina.....	18	Wyoming.....	78	Trichinosis:	
Wisconsin.....	1,250	Dengue:		Connecticut.....	1
Diarrhea:		Texas.....	1	Tularaemia:	
South Carolina.....	359	Dysentery:		Iowa.....	52
Encephalitis, epidemic or		Connecticut (amoebic).....	1	Missouri.....	16
lethargic:		Connecticut (bacillary).....	7	Texas.....	3
Wisconsin.....	1	Missouri.....	1	West Virginia.....	1
German measles:		Texas (amoebic).....	10	Wyoming.....	6
South Carolina.....	5	Texas (bacillary).....	85	Typhus fever:	
Wisconsin.....	42	Encephalitis, epidemic or		Texas.....	34
Hookworm disease:		lethargic:		Undulant fever:	
South Carolina.....	97	Iowa.....	3	Connecticut.....	4
Mumps:		West Virginia.....	1	Iowa.....	19
New Hampshire.....	1	German measles:		Missouri.....	3
South Carolina.....	20	Connecticut.....	10	Texas.....	21
Wisconsin.....	577	Iowa.....	5	Wyoming.....	2
Ophthalmia neonatorum:		Wyoming.....	1	Vincent's infection:	
South Carolina.....	8	Leprosy:		Wyoming.....	1
Rabies in animals:		Texas.....	1	Whooping cough:	
South Carolina.....	15	Mumps:		Connecticut.....	307
Scabies:		Connecticut.....	137	Delaware.....	65
Alaska.....	2	Delaware.....	4	Iowa.....	48
Septic sore throat:		Iowa.....	154	Missouri.....	65
South Carolina.....	6	Missouri.....	24	New Hampshire.....	10
Wisconsin.....	2	New Hampshire.....	19	Texas.....	167
		Texas.....	27	West Virginia.....	39
				Wyoming.....	16

## WEEKLY REPORTS FROM CITIES

City reports for week ended December 2, 1939

This table summarizes the reports received weekly from a selected list of 140 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table.

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Small-pox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Data for 90 cities:											
5-year average.....	231	172	44	864	598	1,258	12	343	31	1,136	-----
Current week <sup>1</sup> .....	107	136	27	547	394	890	1	325	51	798	-----
Maine:											
Portland.....	0	-----	0	3	1	0	0	0	0	3	22
New Hampshire:											
Concord.....	0	-----	0	0	2	1	0	0	0	0	13
Manchester.....	0	-----	0	0	1	0	0	0	0	0	19
Nashua.....	0	-----	0	0	0	0	0	0	0	0	9
Vermont:											
Barre.....	0	-----	0	0	0	0	0	0	0	0	3
Massachusetts:											
Boston.....	3	-----	0	28	13	21	0	5	1	13	187
Fall River.....	0	-----	0	0	1	0	0	1	0	14	31
Springfield.....	0	-----	0	1	0	3	0	2	0	2	28
Worcester.....	0	-----	0	2	10	9	0	1	0	3	60
Rhode Island:											
Pawtucket.....	0	-----	0	0	0	0	0	0	0	1	15
Providence.....	0	-----	0	79	3	2	0	1	0	11	72

<sup>1</sup> Figures for Barre, Terre Haute, Racine, and Los Angeles estimated; reports not received.

## City reports for week ended December 2, 1939—Continued

State and city	Diph- theria cases	Influenza		Meas- les cases	Pneu- monia deaths	Scarlet fever cases	Small- pox cases	Tuber- culosis deaths	Ty- phoid fever cases	Whoop- ing cough cases	Deaths, all causes
		Cases	Deaths								
Connecticut:											
Bridgeport.....	0		0	0	0	4	0	0	0	0	33
Hartford.....	1		0	0	2	1	0	0	0	9	36
New Haven.....	0		0	1	2	1	0	0	0	7	46
New York:											
Buffalo.....	0		0	14	8	10	0	7	0	6	142
New York.....	15	4	3	20	85	109	0	71	2	85	1,482
Rochester.....	0	1	0	0	4	3	0	0	0	3	73
Syracuse.....	1		0	0	2	4	0	0	3	25	56
New Jersey:											
Camden.....	2		0	0	2	7	0	0	0	4	24
Newark.....	0		0	0	1	8	0	7	0	29	113
Trenton.....	0		0	0	4	3	0	2	0	3	51
Pennsylvania:											
Philadelphia.....	2	2	1	3	18	50	0	25	3	70	541
Pittsburgh.....	5		0	3	12	25	0	7	1	18	165
Reading.....	1		0	0	0	0	0	0	0	2	18
Scranton.....	0			0		2	0		0	0	
Ohio:											
Cincinnati.....	8		1	1	7	18	0	6	0	9	140
Cleveland.....	1	23	0	1	12	26	0	9	0	51	186
Columbus.....	2	2	2	2	3	6	0	1	0	0	99
Toledo.....	0	1	0	3	3	23	0	4	2	8	75
Indiana:											
Anderson.....	1		0	0	0	0	0	0	0	7	4
Fort Wayne.....	0		0	0	2	3	0	1	0	0	31
Indianapolis.....	1		0	2	10	32	0	4	0	15	107
Muncie.....	0		0	0	0	2	0	0	0	1	8
South Bend.....	0		0	1	2	2	0	0	0	8	16
Terre Haute.....											
Illinois:											
Alton.....	0		0	0	0	2	0	0	0	0	8
Chicago.....	11	4	2	15	21	119	0	35	0	51	653
Elgin.....	1		0	0	1	0	0	0	0	5	9
Moline.....	0		0	0	0	0	0	0	0	0	10
Springfield.....	0		0	0	8	1	0	0	0	4	25
Michigan:											
Detroit.....	7	2	0	8	12	75	0	15	0	44	253
Flint.....	1		0	2	2	9	0	0	0	12	20
Grand Rapids.....	0		0	0	0	19	0	1	0	7	41
Wisconsin:											
Kenosha.....	0		0	0	0	1	0	0	0	3	10
Madison.....	0		0	2	0	1	1	0	0	9	13
Milwaukee.....	0	1	1	1	2	35	0	3	0	20	80
Racine.....											
Superior.....	0		0	1	0	2	0	0	0	0	5
Minnesota:											
Duluth.....	0		0	11	1	0	0	1	0	0	16
Minneapolis.....	0		0	24	4	25	0	0	0	6	99
St. Paul.....	0		0	1	4	10	0	3	0	26	50
Iowa:											
Cedar Rapids.....	0			3		0	0		0	1	
Davenport.....	1			1		3	0		0	1	
Des Moines.....	0		0	15	0	13	0	0	0	0	34
Sioux City.....	0			1		5	0		0	0	
Waterloo.....	0			0		3	0		0	0	
Missouri:											
Kansas City.....	2		0	1	7	13	0	2	0	0	113
St. Joseph.....	0		0	1	3	5	0	0	0	0	33
St. Louis.....	3		0	2	6	24	0	7	2	10	232
North Dakota:											
Fargo.....	0		0	0	0	2	0	0	0	0	8
Grand Forks.....	0			0		0	0		0	0	
Minot.....	0		0	0	0	0	0	0	0	0	8
South Dakota:											
Aberdeen.....	0			0		0	0		0	0	
Nebraska:											
Lincoln.....	1			0		1	0		0	5	
Omaha.....	4		0	0	3	1	0	0	0	1	45
Kansas:											
Lawrence.....	0		0	0	0	0	0	0	0	0	12
Topeka.....	1		0	0	2	4	0	0	0	1	16
Wichita.....	0		0	26	3	5	0	0	0	0	31

## City reports for week ended December 2, 1939—Continued

State and city	Diph- theria cases	Influenza		Meas- sles cases	Pneu- monia deaths	Scarlet fever cases	Small- pox cases	Tuber- culosis deaths	Ty- phoid fever cases	Whoop- ing cough cases	Deaths, all causes
		Cases	Deaths								
Delaware:											
Wilmington.....	1	-----	0	0	5	7	0	0	0	0	33
Maryland:											
Baltimore.....	2	1	0	1	12	8	0	14	0	43	239
Cumberland.....	0	-----	0	0	0	3	0	0	2	0	9
Frederick.....	0	-----	0	0	1	3	0	0	0	0	5
Dist of Col.:											
Washington.....	1	1	0	2	6	16	0	9	1	19	171
Virginia:											
Lynchburg.....	0	-----	0	2	0	2	0	1	0	16	11
Richmond.....	1	-----	2	2	3	2	0	3	0	0	72
Roanoke.....	1	-----	0	0	0	1	0	0	0	0	16
West Virginia:											
Charleston.....	1	1	0	0	0	1	0	0	0	1	14
Huntington.....	1	-----	-----	0	-----	1	0	-----	0	0	-----
Wheeling.....	0	-----	0	0	1	2	0	0	1	0	23
North Carolina:											
Gastonia.....	1	-----	-----	0	-----	1	0	-----	0	0	-----
Raleigh.....	0	-----	0	0	1	0	0	0	0	0	17
Wilmington.....	3	-----	0	0	0	0	0	0	0	0	9
Winston-Salem.....	1	-----	0	0	1	2	0	2	0	0	19
South Carolina:											
Charleston.....	1	31	0	0	3	3	0	4	0	0	28
Florence.....	0	-----	0	0	2	0	0	0	0	0	15
Greenville.....	0	-----	0	0	1	1	0	1	0	0	16
Georgia:											
Atlanta.....	1	12	1	1	5	7	0	5	0	0	99
Brunswick.....	0	-----	0	0	0	0	0	0	0	0	2
Savannah.....	0	26	2	0	2	0	0	0	0	1	34
Florida:											
Miami.....	0	4	1	0	3	0	0	1	0	1	38
Tampa.....	1	-----	0	0	1	0	0	0	0	0	32
Kentucky:											
Ashland.....	0	-----	0	0	3	0	0	0	0	2	5
Covington.....	0	-----	0	1	1	1	0	2	0	0	11
Lexington.....	0	-----	0	0	0	2	0	0	0	0	18
Louisville.....	0	2	0	1	3	13	0	0	0	46	41
Tennessee:											
Knoxville.....	0	-----	0	0	3	10	0	2	0	0	24
Memphis.....	0	-----	0	0	5	6	0	4	1	8	69
Nashville.....	2	-----	2	0	6	2	0	0	0	5	51
Alabama:											
Birmingham.....	2	0	1	0	2	3	0	6	0	1	65
Mobile.....	1	-----	1	0	4	8	0	3	0	0	31
Montgomery.....	0	-----	-----	0	-----	0	0	-----	0	0	-----
Arkansas:											
Fort Smith.....	0	-----	0	0	-----	0	0	-----	0	0	-----
Little Rock.....	0	-----	0	0	0	1	0	1	0	0	-----
Louisiana:											
Lake Charles.....	0	-----	0	0	0	0	0	0	0	0	3
New Orleans.....	3	2	2	0	10	14	0	11	19	23	160
Shreveport.....	0	-----	0	0	3	6	0	1	0	0	32
Oklahoma:											
Oklahoma City.....	0	1	0	0	5	1	0	1	0	0	33
Tulsa.....	0	-----	-----	1	-----	2	0	0	0	3	-----
Texas:											
Dallas.....	2	1	1	0	2	1	0	1	0	5	60
Fort Worth.....	0	-----	0	0	1	1	0	1	0	0	23
Galveston.....	0	-----	0	0	3	3	0	0	0	0	15
Houston.....	2	-----	1	0	4	2	0	6	0	0	80
San Antonio.....	4	2	0	6	6	1	0	6	1	0	62
Montana:											
Billings.....	0	-----	0	1	0	0	0	0	0	0	6
Great Falls.....	0	-----	0	0	0	0	0	0	0	0	9
Helena.....	0	-----	0	0	0	0	0	0	0	0	4
Missoula.....	0	-----	0	0	2	0	0	0	0	1	11
Idaho:											
Boise.....	0	-----	0	0	1	0	0	0	0	0	3
Colorado:											
Denver.....	1	-----	1	2	2	5	0	4	1	6	70
Pueblo.....	0	-----	0	0	2	1	0	0	0	0	10
New Mexico:											
Albuquerque.....	0	-----	0	0	0	1	0	2	1	0	6
Utah:											
Salt Lake City.....	0	-----	0	32	1	14	1	2	0	32	31

## City reports for week ended December 2, 1939—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Small-pox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Washington:											
Seattle.....	0		1	13	1	2	0	3	4	3	113
Spokane.....	0	1	0	1	1	5	0	1	0	4	30
Tacoma.....	0			219	2	0	0	0	0	1	29
Oregon:											
Portland.....	4		0	0	2	0	0	3	0	2	93
Salem.....	0			4		0	0		0	0	
California:											
Los Angeles.....											
Sacramento.....	0	1	1	1	2	4	0	3	1	0	43
San Francisco..	1		0	3	3	8	0	8	0	33	162

State and city	Meningitis, meningococcus		Polio-myelitis cases	State and city	Meningitis, meningococcus		Polio-myelitis cases
	Cases	Deaths			Cases	Deaths	
Massachusetts:				South Dakota:			
Boston.....	1	0	0	Aberdeen.....	0	0	1
Worcester.....	0	0	1	Kentucky:			
New York:				Covington.....	0	0	1
Buffalo.....	0	0	1	Oklahoma:			
New York.....	0	1	2	Tulsa.....	0	0	1
Pennsylvania:				Texas:			
Philadelphia.....	1	0	2	Dallas.....	0	1	0
Ohio:				Fort Worth.....	0	0	1
Cleveland.....	1	0	0	Houston.....	1	0	0
Michigan:				Utah:			
Detroit.....	0	1	1	Salt Lake City.....	0	0	1
Iowa:				Oregon:			
Des Moines.....	0	0	1	Portland.....	0	0	2
Missouri:				California:			
Kansas City.....	0	0	1	Sacramento.....	0	0	1

*Encephalitis, epidemic or lethargic.*—Cases: New York, 1; Milwaukee, 1.

*Fellagra.*—Cases: Baltimore, 1; Charleston, S. C., 2; Miami, 1.

*Typhus fever.*—Cases: Worcester, 2; Baltimore, 1; Wilmington, N. C., 1; Atlanta, 3; Savannah, 4; Nashville, 4; Mobile, 1; Lake Charles, 1; Fort Worth, 1.

## FOREIGN REPORTS

### CUBA

*Habana—Communicable diseases—4 weeks ended October 21, 1939.*—During the 4 weeks ended October 21, 1939, certain communicable diseases were reported in Habana, Cuba, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Diphtheria.....	7	-----	Tuberculosis.....	-----	1
Malaria.....	16	1	Typhoid fever.....	13	3
Poliomyelitis.....	1	-----			

### DENMARK

*Notifiable diseases—July–September 1939.*—During the months of July, August, and September 1939, cases of certain notifiable diseases were reported in Denmark as follows:

Disease	July	Aug.	Sept.	Disease	July	Aug.	Sept.
Cerebrospinal meningitis.....	5	3	5	Measles.....	686	361	363
Chickenpox.....	471	385	302	Mumps.....	79	95	106
Diphtheria.....	31	66	85	Paratyphoid fever.....	23	14	13
Dysentery.....	58	57	72	Poliomyelitis.....	3	13	36
Epidemic encephalitis.....	2	-----	1	Puerperal fever.....	15	15	26
Erysipelas.....	178	215	314	Scarlet fever.....	548	563	791
Gastroenteritis, infectious.....	2,266	5,387	4,424	Syphilis.....	33	51	50
German measles.....	135	149	118	Tetanus, neonatorum.....	3	3	3
Gonorrhea.....	725	833	822	Typhoid fever.....	-----	5	1
Influenza.....	2,368	3,323	5,215	Undulant fever.....	42	45	31
Malaria.....	-----	9	4	Well's disease.....	-----	2	5
				Whooping cough.....	3,249	3,349	2,507

### FINLAND

*Communicable diseases—October 1939.*—During the month of October 1939, cases of certain communicable diseases were reported in Finland as follows:

Disease	Cases	Disease	Cases
Diphtheria.....	283	Scarlet fever.....	614
Influenza.....	1,296	Typhoid fever.....	21
Paratyphoid fever.....	51	Undulant fever.....	1
Poliomyelitis.....	6		

## ITALY

*Communicable diseases—4 weeks ended September 10, 1939.*—During the 4 weeks ended September 10, 1939, cases of certain communicable diseases were reported in Italy as follows:

Disease	Aug. 14-20	Aug. 21-27	Aug. 28- Sept. 3	Sept. 4-10
Anthrax.....	35	46	51	15
Cerebrospinal meningitis.....	9	18	11	18
Chickenpox.....	113	81	74	65
Diphtheria.....	388	492	423	456
Dysentery (amoebic).....	13	8	20	19
Dysentery (bacillary).....	33	73	41	31
Hookworm disease.....	19	42	58	22
Lethargic encephalitis.....	1			1
Measles.....	341	308	249	204
Mumps.....	83	123	62	56
Paratyphoid fever.....	168	179	186	157
Pellagra.....	6	3	18	2
Poliomyelitis.....	181	190	220	186
Puerperal fever.....	24	27	25	18
Scarlet fever.....	175	182	168	209
Typhoid fever.....	867	940	801	882
Undulant fever.....	79	79	62	51
Whooping cough.....	353	340	234	245

## SWITZERLAND

*Notifiable diseases—August 1939.*—During the month of August 1939, cases of certain notifiable diseases were reported in Switzerland as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis.....	7	Paratyphoid fever.....	27
Chickenpox.....	107	Poliomyelitis.....	125
Diphtheria.....	72	Scarlet fever.....	320
Dysentery.....	1	Tuberculosis.....	199
German measles.....	7	Typhoid fever.....	13
Measles.....	51	Undulant fever.....	14
Mumps.....	18	Whooping cough.....	308

## YUGOSLAVIA

*Communicable diseases—4 weeks ended October 8, 1939.*—During the 4 weeks ended October 8, 1939, certain communicable diseases were reported in Yugoslavia as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax.....	73	6	Poliomyelitis.....	15	1
Cerebrospinal meningitis.....	18	5	Scarlet fever.....	379	2
Diphtheria and croup.....	921	48	Sepsis.....	9	2
Dysentery.....	195	26	Tetanus.....	40	16
Erysipelas.....	229	9	Typhoid fever.....	700	44
Favus.....	7		Typhus fever.....	9	1
Lethargic encephalitis.....	1	1	Weil's disease.....	1	
Paratyphoid fever.....	42	1			

**REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND  
YELLOW FEVER RECEIVED DURING THE CURRENT WEEK**

NOTE.—A cumulative table giving current information regarding the world prevalence of quarantinable diseases for a six-month period appeared in the PUBLIC HEALTH REPORTS of November 24, 1939, pages 2106-2119. A similar cumulative table will appear in future issues of the PUBLIC HEALTH REPORTS for the last Friday of each month.

**Cholera**

*India (Portuguese).*—Cholera has been reported in Portuguese India as follows: Week ended September 23, 1939, three cases, two deaths; week ended September 30, nine cases, six deaths; week ended October 7, three cases, five deaths.

**Plague**

*Hawaii Territory—Island of Hawaii—Hamakua District—Paauhau area.*—A rat found on November 18, 1939, in Paauhau area, Hamakua District, Island of Hawaii, T. H., has been proved positive for plague.

*Venezuela—Aragua State.*—A report dated December 7, 1939, states that three cases of bubonic plague have been reported on La Florida farm in the Sierra Azul region, south of Tejerias, Aragua State, Venezuela. All precautionary measures have been taken.

**Smallpox**

*Mexico.*—During the month of September 1939, smallpox was reported in Mexico as follows: Mexico, D. F., four cases; Monterrey, Nuevo Leon State, one case, two deaths; San Luis Potosi, San Luis Potosi State, six cases, one death.

**Typhus Fever**

*Mexico.*—During the month of September 1939, typhus fever was reported in Mexico as follows: Mexico, D. F., twenty-five cases, three deaths; Monterrey, Nuevo Leon State, three cases; San Luis Potosi, San Luis Potosi State, one case.

**Yellow Fever**

*Ivory Coast—Abengourou (vicinity of).*—On December 1, 1939, one suspected case of yellow fever was reported on Broumia Plantation near Abengourou, Ivory Coast.

*Senegal—Louga.*—On December 5, 1939, one suspected case of yellow fever was reported in Louga, Senegal.